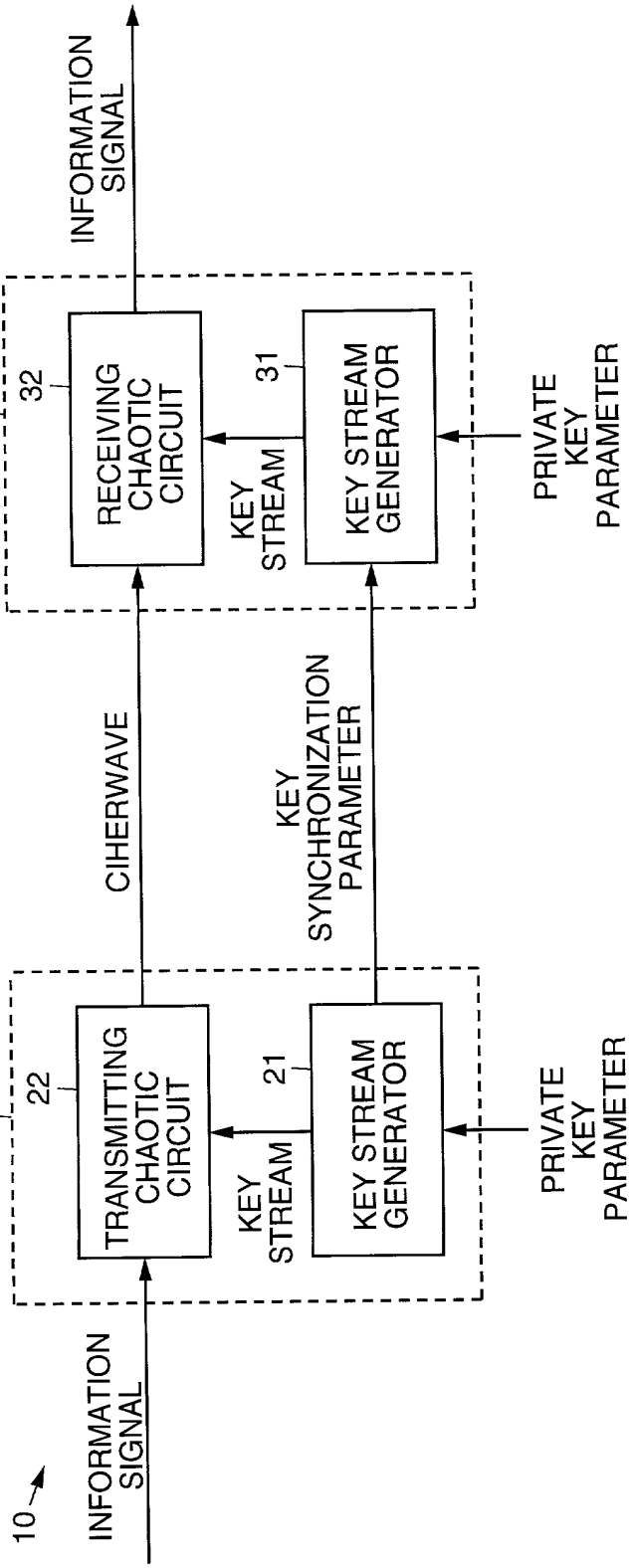

10
INFORMATION SIGNAL
20
22
TRANSMITTING CHAOTIC CIRCUIT
KEY STREAM
21
KEY STREAM GENERATOR
PRIVATE KEY PARAMETER
CIHERWAVE
KEY SYNCHRONIZATION PARAMETER
30
32
RECEIVING CHAOTIC CIRCUIT
KEY STREAM
31
KEY STREAM GENERATOR
PRIVATE KEY PARAMETER
INFORMATION SIGNAL

Fig. 1

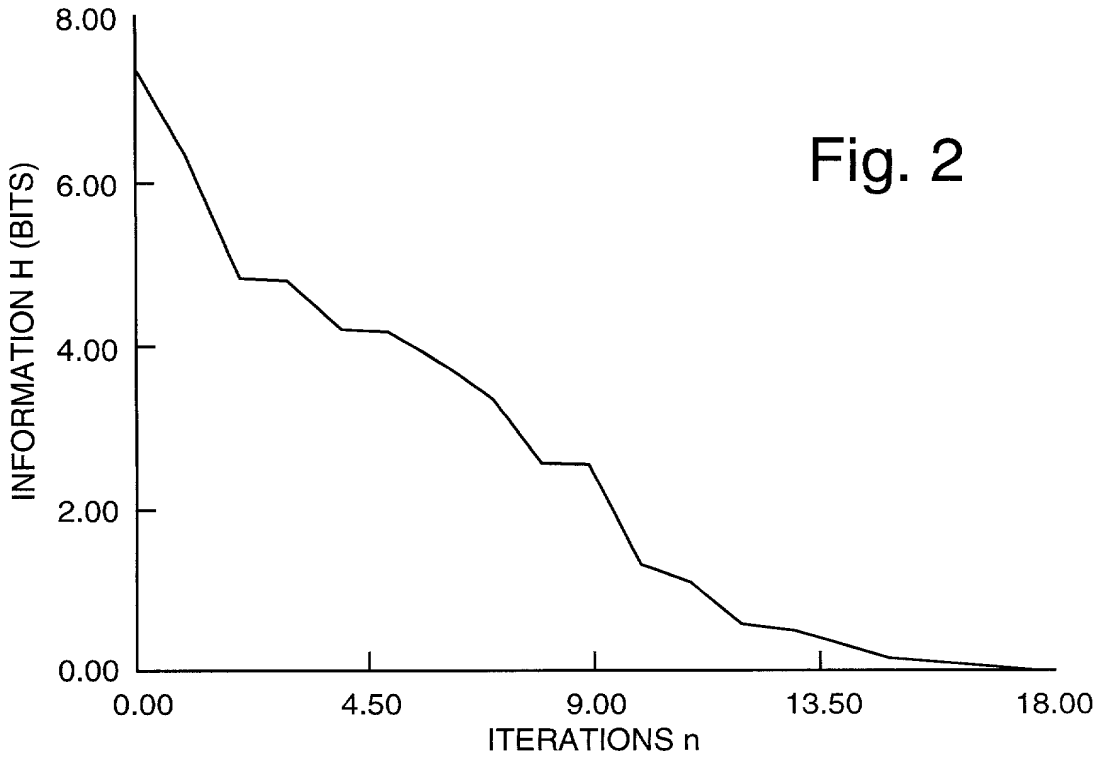

8.00
6.00
4.00
2.00
0.00
INFORMATION H (BITS)
0.00
4.50
9.00
13.50
18.00
ITERATIONS n

Fig. 2

Fig. 3

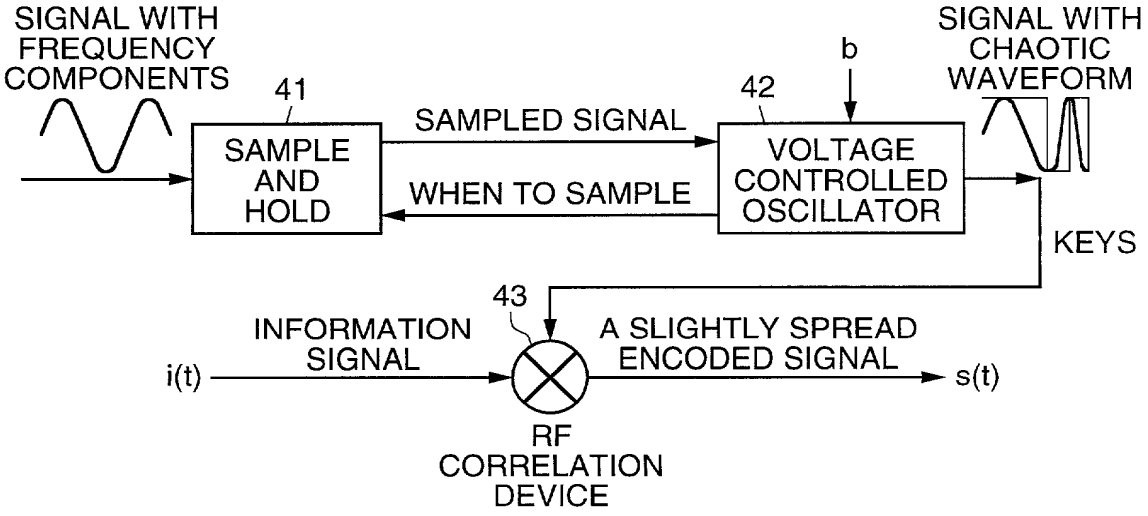

SIGNAL WITH FREQUENCY COMPONENTS
41
SAMPLE AND HOLD
SAMPLED SIGNAL
WHEN TO SAMPLE
42
b
VOLTAGE CONTROLLED OSCILLATOR
SIGNAL WITH CHAOTIC WAVEFORM
KEYS
43
INFORMATION SIGNAL
i(t)
A SLIGHTLY SPREAD ENCODED SIGNAL
s(t)
RF CORRELATION DEVICE

Fig. 4

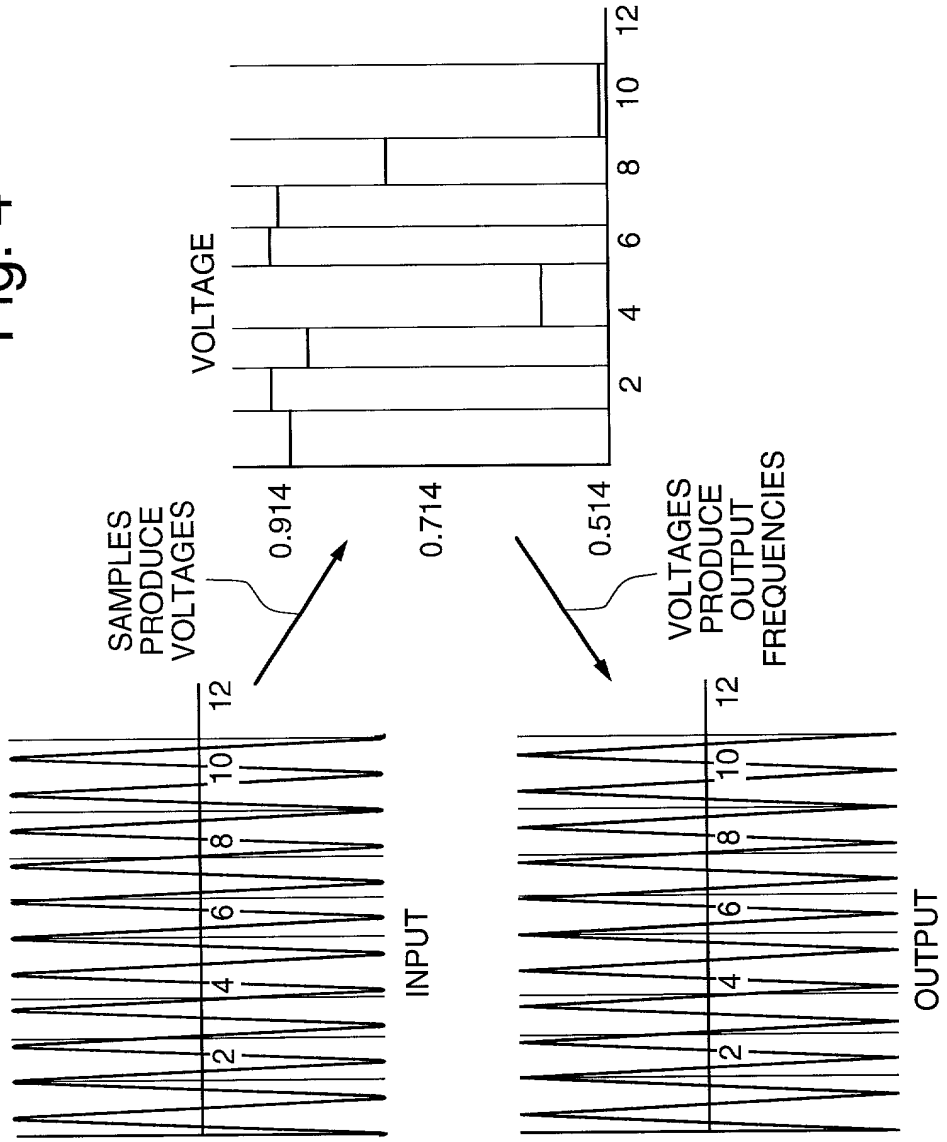

INPUT
2
4
6
8
10
12
SAMPLES PRODUCE VOLTAGES
0.914
0.714
0.514
VOLTAGE
2
4
6
8
10
12
VOLTAGES PRODUCE OUTPUT FREQUENCIES
OUTPUT
2
4
6
8
10
12

Fig. 5

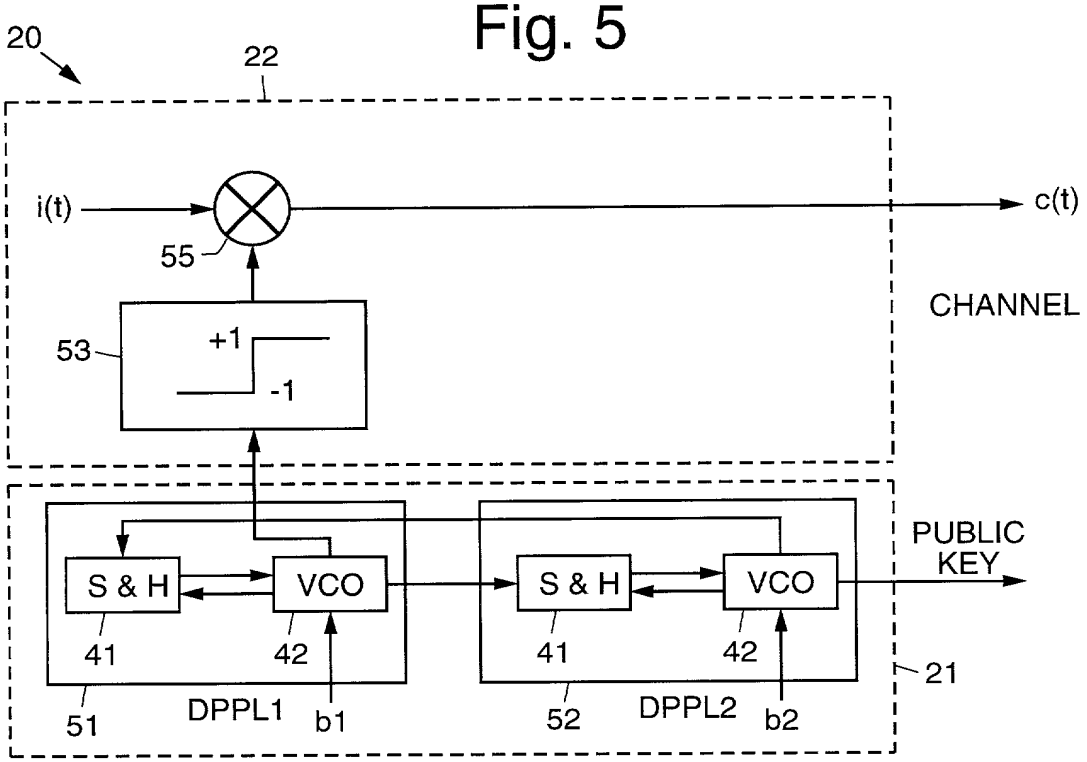

20
22
i(t)
55
c(t)
CHANNEL
53
+1
-1
S & H
VCO
S & H
VCO
PUBLIC KEY
41
42
41
42
21
51
DPPL1
b1
52
DPPL2
b2

Fig. 6

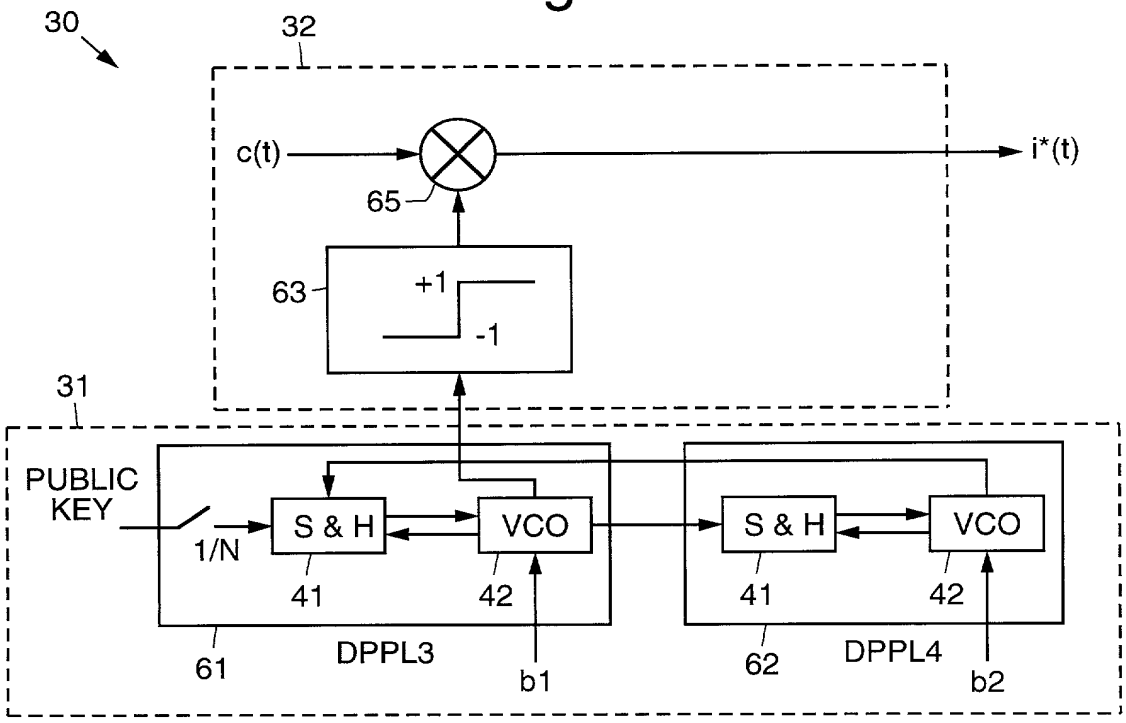
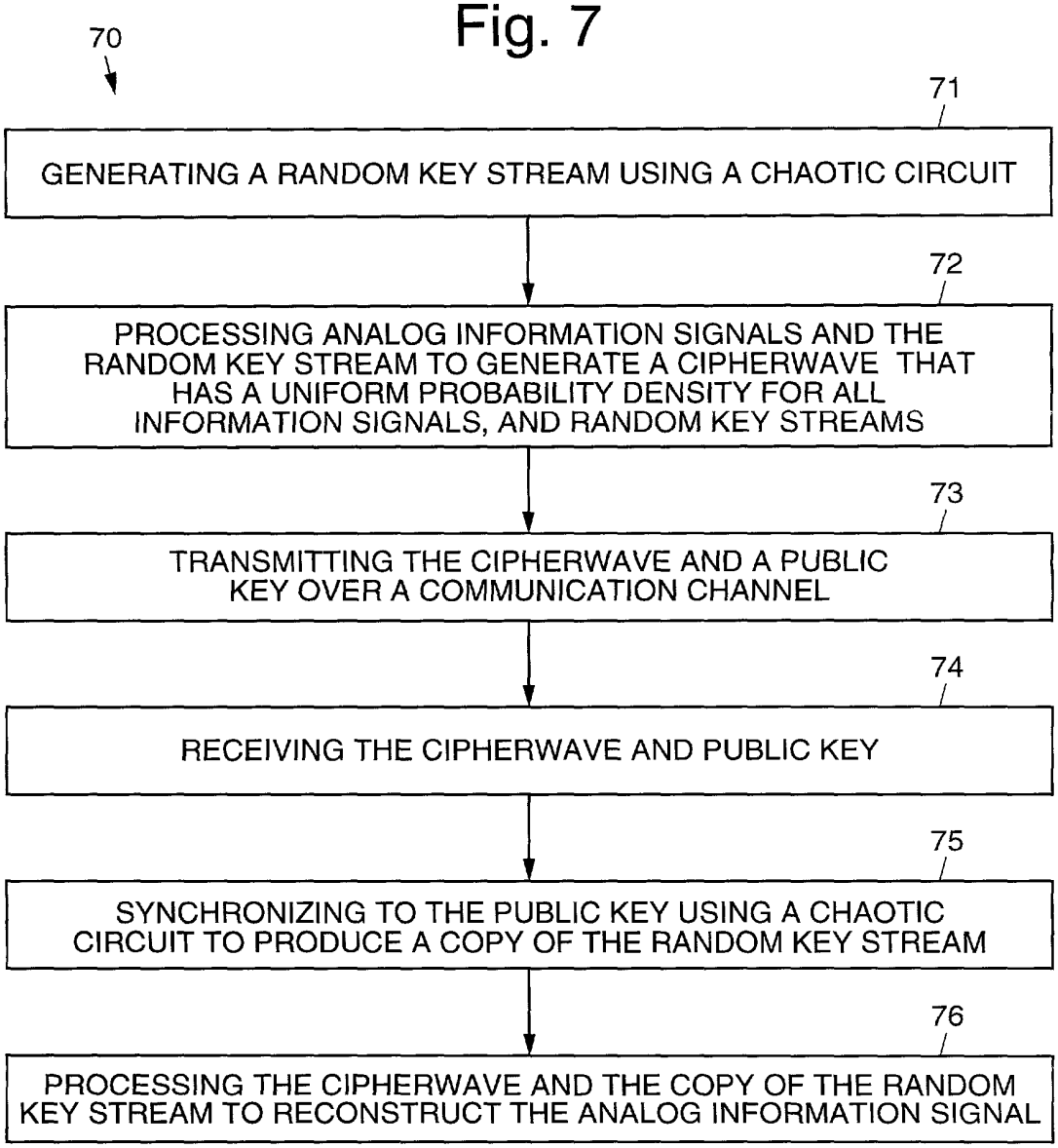

30
32
c(t)
i*(t)
65
63
+1
-1
31
PUBLIC KEY
1/N
S & H
VCO
S & H
VCO
41
42
41
42
61
DPPL3
b1
62
DPPL4
b2

Fig. 7


70
71
GENERATING A RANDOM KEY STREAM USING A CHAOTIC CIRCUIT
72
PROCESSING ANALOG INFORMATION SIGNALS AND THE RANDOM KEY STREAM TO GENERATE A CIPHERWAVE THAT HAS A UNIFORM PROBABILITY DENSITY FOR ALL INFORMATION SIGNALS, AND RANDOM KEY STREAMS
73
TRANSMITTING THE CIPHERWAVE AND A PUBLIC KEY OVER A COMMUNICATION CHANNEL
74
RECEIVING THE CIPHERWAVE AND PUBLIC KEY
75
SYNCHRONIZING TO THE PUBLIC KEY USING A CHAOTIC CIRCUIT TO PRODUCE A COPY OF THE RANDOM KEY STREAM
76
PROCESSING THE CIPHERWAVE AND THE COPY OF THE RANDOM KEY STREAM TO RECONSTRUCT THE ANALOG INFORMATION SIGNAL